EUCIDARIS POMEL, 1883, *PAPULA* BAYLE, 1878, *CIDARIS PAPILLATACONOIDEA* PARKINSON, 1811 AND *CIDARIS SAVIGNYI* AUDOUIN, 1826, PROPOSED SUPPRESSION ; COUPLED WITH VALIDATION OF *EUCIDARIS* DÖDERLEIN, 1887, *STEREOCIDARIS* POMEL, 1883, AND *DIADEMA SAVIGNYI* MICHELIN, 1845 (CLASS ECHINOIDEA). Z.N.(S.) 1705

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1. *Eucidaris.*

In 1883 (p. 109), Pomel introduced the name *Eucidaris* for a subdivision (subgenus or "section") of *Cidaris* Lamarck, the only information about it being "tubercules à col lisse: trois espèces vivantes; presque toutes les espéces (of *Cidaris* sensu extenso) tertiares; toutes les espèces crétacées, moins une (20); quelques jurassiques seulement (*C. Morieri*, *Honorinae*, *propinqua*, *marginata*, *monilifera*, *multipunctata*); la plupart des triassiques (7)". No further mention of recent species is made by Pomel under the headings of the other subdivisions of *Cidaris* and clearly the only reason why he picked out the six Jurassic species for mention by name was because they represented only a proportion of the species of *Cidaris* sensu extenso known from that period, it being desirable to specify which ones.

Döderlein (1887) made a provisional revision of the Cidaridae and rediagnosed as " useful Groups " of species (having the appearance of genera) a number of previously described taxa which had been referred to the family including those variously treated by Pomel as genera, subgenera and " sections ". Under *Eucidaris* Pomel, (p. 42) Döderlein listed six species by name, *metularia*, *tribuloides*, *Thouarsii* and *galapagensis* being recent while *melitensis* and *loveni* are Tertiary; he noted that the last two, together with the Cretaceous *Lardyi*, are probably referable to *Dorocidaris* rather than *Eucidaris.*

In the early 1900s several other specialists on echinoids debated the validity and limits of *Eucidaris*, notably H. L. Clark (1909), who commented that Pomel designated no type-species for *Eucidaris* but that Döderlein, using *Eucidaris* in the same sense as Pomel, listed *metularia* first among the included species so that " we may very conveniently consider that species as the genotype ". In an additional note on Clark's contribution, Bather added that he " sees no objection to the adoption of *Eucidaris* Pomel, with genotype *E. metularia.* We may well suppose that the ' trois espèces vivantes ' of Pomel's list were *Cidaris metularia*, *C. tribuloides*, and *C. thouarsi* ."

Under Article 69(a)(i) of the Code, a subsequent designation of type-species must be restricted to those nominal species originally included and cited by name. This therefore excludes the recent species and accordingly Cooke (1959, p. 8), in a footnote, rejected H. L. Clark's proposal and designated *Cidarites moniliferus* Goldfuss, 1826, as type-species of *Eucidaris.*

Philip (1963) reiterated Cooke's observations and redescribed the type material of *Eucidaris moniliferus*, concluding from his studies that the species is not generically distinct from *Cidaris cretosa* Mantell, the type-species of the

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genus *Stereocidaris*. Thus *Eucidaris* Pomel should be referred to the synonymy of *Stereocidaris* also of Pomel, 1883, diagnosed on the succeeding page to *Eucidaris* and therefore not having page priority, though this was deliberately ignored by Philip in the interests of nomenclatorial stability. At the same time, Philip noted that the recent species named by Döderlein are almost certainly not congeneric with *E. moniliferus* and were left without a generic name as a consequence. This is very regrettable for neontologists since both *tribuloides* and *metularia* are common tropical species and their names appear in a great many publications in combination with *Eucidaris*.

The only way in which stability could be insured in this case is for the International Commission to reject *Eucidaris* Pomel, 1883 and validate *Eucidaris* Döderlein, 1887, with type-species *Cidarites metularia* Lamarck.

2. *Stereocidaris*.

In 1883 (p. 110) Pomel recognised the genus *Stereocidaris*. His description was as follows " Stereocidaris pourrait presque former sousgenre caractérisé par un apex très persistant, ayant des sutures épaisses pour des anales en pavé. Les tubercules interambulacraires sont atrophiés en dessus. Les espèces sont crétacées: *Cidaris cretosa*, *Merceyi*, *Cartieri*, etc." He figured the apical disc of a specimen he identified as *Stereocidaris cretosa* (fig. 34). No type species was selected. In 1887 (p. 42) Döderlein re-described *Stereocidaris*, treating it as a subgenus of *Cidaris*, and listed the following species from the Cretaceous; "*subvesiculosa*, *cretosa*, *Merceyi*, *Carteri*, *serrata*, *sceptrifera*, *atropha*". He also included three recent species in this genus; *Cidaris* (*Stereocidaris*) *grandis*, *C.*(*S*). *japonica*, and *C.*(*S*). *sceptriferoides*. Döderlein also did not select a type species. The first selection of type-species was made by Lambert & Thiéry in 1909 (p. 31); they selected *Cidaris cretosa* Mantell, 1829.

Cidaris sceptrifera Mantell, which Döderlein includes in *Stereocidaris*, was based on a primary radiole figured by Mantell in 1822 (pp. 194, 313, pl. XVII fig. 12). Although the test was not figured, the primary radioles of *Cidaris sceptrifera* are of a form unique to this species, and specimens were later found in which the characteristic radioles are associated with the test. Examples of these specimens have been figured by Cotteau 1862 (pl. 1058), and Wright 1882 (pl. VI, pl. VII figs. 1, & 2). Bayle 1878 (pl. 148, fig. 1) refigured the specimen of *Cidaris sceptrifera* figured by Cotteau in 1862. In his explanation of the plate he introduced the generic name *Papula* in combination with the specific name *sceptrifera* of Mantell. Bayle's figure is very clear and the original specimen undoubtedly belongs to this species. The characters of the interambulacra and apical disc of *Cidaris sceptrifera* Mantell allow it to be included in *Stereocidaris* Pomel. *Papula* Bayle, 1878, with type species by monotypy *Cidaris sceptrifera* Mantell, therefore has priority over *Stereocidaris* Pomel, 1883. Lambert and Thiéry, 1910 (p. 141) included *Papula* in the synonymy of the nominate subgenus *Cidaris*. Apart from this citation the generic name *Papula* has appeared only in lists such as Neave, 1940. However, the genus *Stereocidaris* is well known to both palaeontologists and neontologists and appears extensively in the literature. The use of the generic name *Papula* would, therefore, only lead to confusion.

Stereocidaris, however, is endangered by a lack of knowledge of its type-species *Cidaris cretosa* Mantell. When naming this species, Mantell, 1829 (p. 205) cited two figures published in Parkinson's " Organic Remains of a former World", 1811. These two figures in order of citation are Pl. IV, fig. 3, and Pl. I, fig. 11. Mantell overlooked the fact that Parkinson had named the original of Pl. I, fig. 11 *Cidaris papillataconoidea* (1811, p. 13 as *Cidaris papillata conoidea*); Plate IV figure 3 was not specifically named by Parkinson. Parkinson's original specimens are now lost. *Cidaris papillataconoidea* Parkinson is shown in apical view only and the test is incomplete, but sufficient is preserved to show the reduction of the primary tubercles on the upper interambulacral plates. The figure (Pl. I, fig. 11) is not identifiable with any certainty although it shows resemblance to the species later called *Cidaris merceyi* by Cotteau in 1862. The original of plate IV fig. 3 does not apparently belong to our present concept of *Stereocidaris* and shows some resemblance to the species later named *Cidaris peronata* by Forbes in 1850. No lectotype has been selected for *Cidaris cretosa* Mantell and the original of pl. I, fig. 11 is hereby selected as lectotype of this species. *Cidaris cretosa* Mantell, 1829 thus becomes an objective junior synonym of *Cidaris papillata conoidea* Parkinson, 1811. The original of Parkinson's figure of *C. papillataconoidea* is now lost and the figure is insufficient to determine the species. Moreover, the name has not been used in the subsequent literature. It is important to note that Mantell in 1850 refigured both Parkinson's plates I and IV (as plates LIII and LVI respectively) and identified Pl. I, fig. 11 (on p. 126) and Pl. IV, fig. 3 (on p. 131) as *Cidaris vesiculosus* Goldfuss abandoning his earlier specific name. The difficulty of recognising *Cidaris cretosa* Mantell has also been discussed by Cotteau, 1862 (pp. 208–281; see also p. 257). It is requested below that the Commission invoke its plenary powers to reject *Cidaris papillataconoidea* Parkinson for the sake of stability. The loss of the type specimen (the original of Parkinson, 1811, Pl. I, fig. 11) and the lack of a lateral view of the test, renders the species unrecognisable; the apical view, the only view figured by Parkinson, being insufficient to determine the taxon.

It is now necessary to stabilise the selection of a type-species for *Stereocidaris* Pomel 1883. Both Lambert and Thiéry 1909 and Mortensen 1909 (p. 55) selected *Cidaris cretosa* Mantell, 1829 as type species, the former workers having precedence. However, Lambert and Thiéry, possibly realising the instability of *Cidaris cretosa*, substituted *Cidaris merceyi* Cotteau, 1862 as type-species in 1910 (p. 152). *Cidaris merceyi* Cotteau, 1862 is one of the three species listed by Pomel in 1883 and, unlike *Cidaris cretosa* Mantell, is adequately described and figured. Mortensen, 1928 (pp. 225–231) has discussed the genus and it is apparent that the selection of *Cidaris merceyi* Cotteau as type-species would not upset the systematics of recent species of *Stereocidaris*. The International Commission is asked below to set aside all previous type designations for the genus *Stereocidaris* and to designate *Cidaris merceyi* Cotteau, 1862 as type-species of *Stereocidaris* Pomel, 1883, in accordance with the selection made by Lambert and Thiéry in 1910 (p. 152).

3. *Diadema savignyi.*

Following lengthy controversy between Mortensen and H. L. Clark, in 1954 (Opinion 206) the Commission validated the generic name *Diadema* Gray, 1825 with type-species *Echinometra setosa* Leske, 1778.

For many years there has also been controversy about the authorship, validity and distinction (from *D. setosum*) of *Diadema savignyi.*

In Echinoderm plate vi of Savigny's " Description de l'Egypte " (1809–1817) there is a beautiful drawing of the lower side of a *Diadema.* In Audouin's captions to the plates (1826) this is named *Cidarites savignyi* but not described. However, the published drawing is sufficient indication to validate the name with Audouin as author. The type locality was almost certainly either Suez or Qoseir (Kosseir), south of Ghardaqa, these being the two places on the Red Sea at which Napoleon's expeditionary force concentrated its efforts.

Michelin in 1845 (pp. 15–16) published a diagnosis of the species under the heading of " *Diadema savignyii,* Michelin ", noting that it had never been described but mentioning Savigny's drawing. He appears to have derived the name from the catalogue of the Paris Museum, quoting *Cidaris savignyii,* but making no mention of Audouin.

Those following authors who have considered *savignyi* to be distinct from *setosum,* notably H. L. Clark (1925, p. 43) and Mortensen (1904, p. 16 and 1940, p. 265), treat Michelin as the author of *savignyi,* though Mortensen (1940) does insert the name Audouin in brackets before that of Michelin in his heading to the species (but not in the figure captions). H. L. Clark distinguishes *savignyi* from *setosum* by the absence of blue or white spots contrasting with the predominantly black or dark brown colour. Mortensen (1940, p. 268) describes the colour pattern of *savignyi* as consisting of a light blue circum-apical ring from which radiate interambulacral blue lines, contrasting with the isolated light spots of *setosum.* However, he did note that in *Diadema* (species unspecified) there are black chromatophores in the skin which may spread to obscure the light lines joining the white spots to the apical ring. Since then Millott (1953) has shown that specimens of the related West Indian species *Diadema antillarum* Philippi are capable of physiological colour change under the influence of changes in light intensity, from uniformly dark through isolated light spots to a pattern of continuous light lines and a circum-apical ring. There is no reason to suppose that the Indo-Pacific *setosum* and *savignyi* do not share this facility for change in colour so that the pattern is of little, if any, use in determining identity. The other main distinction, supposedly correlated with the colour pattern, was put forward by Mortensen but ignored by H. L. Clark. This is provided by the shape of the valves of the large tridentate pedicellariae, these being narrow in *setosum* and wide in *savignyi,* according to Mortensen. However, not one of the specimens from the Red Sea examined by Mortensen or any of those from the same area in the British Museum collections has broad valves. His sole justification for assuming that specimens with broad valves do occur in the Red Sea is based on a statement by Boutan (1892) that specimens of *Diadema* from Suez show a pattern of blue lines.

There is then every indication that *Diadema savignyi* (Audouin) is a synonym of *D. setosum* (Leske).

Although pedicellaria shape is a relatively minor character for the maintenance of two species and is supported only by a few others of similarly low weight taxonomically, such as the presence of a red ring around the anus and small differences in the apical system of some specimens, it seems to us still worthwhile to distinguish the two, though possibly this would be better done at the infra-specific level. Further studies are needed before this can finally be decided. It is therefore necessary to find a name for the specimens with broad-bladed pedicellariae which occur at various Indo-Pacific localities outside the Red Sea, including Mauritius. Although Michelin did not describe the pedicellariae of his specimens, all those from Mauritius detailed by Mortensen were referred by him to *savignyi* and presumably had broad-bladed pedicellariae, while only one out of twelve specimens from Mauritius in the British Museum collections proves to be *setosum*, the rest having broader-bladed pedicellariae. The likelihood is therefore that Michelin had before him the species which Mortensen called *savignyi*. So here again the interest of stability may best be preserved if the Commission were to validate the later reference, in this case *savignyi* Michelin, at the expense of the earlier, *savignyi* Audouin.

Accordingly, the International Commission is asked:

(1) to use its plenary powers to suppress for the purposes of the Law of Priority but not for those of the Law of Homonymy:
  (a) the generic name *Eucidaris* Pomel, 1883;
  (b) the generic name *Papula* Bayle 1878;
  (c) the specific name *papillataconoidea* Parkinson 1811 as published in combination with *Cidaris papillataconoidea*;
  (d) the specific name *savignyi* Audouin, 1826, as published in the binomen *Cidarites Savignyi*.

(2) to place the following generic names on the Official List of Generic Names in Zoology;
  (a) *Eucidaris* Döderlein, 1887 (p. 42) (gender: feminine), type-species by designation by H. L. Clark, 1909 (p. 88), *Cidarites metularia* Lamarck, 1816;
  (b) *Stereocidaris* Pomel, 1883 (p. 110) (gender: feminine), type species by designation by Lambert and Thiéry, 1910 (p. 152), *Cidaris merceyi* Cotteau, 1862.

(3) to place the following specific names on the Official List of Specific Names in Zoology;
  (a) *savignyi* Michelin, 1845 (p. 15), as published in the binomen *Diadema savignyi*;
  (b) *metularia* Lamarck, 1816 (III p. 56), as published in the binomen *Cidarites metularia* (type-species of *Eucidaris* Döderlein, 1887);
  (c) *merceyi* Cotteau, 1862 (pp. 281–284, pl. 1068), as published in the binomen *Cidaris merceyi*.

(4) to place the following generic names (as suppressed under the plenary powers in (1) above) on the Official Index of Rejected and Invalid Generic Names in Zoology;
  (a) *Eucidaris* Pomel, 1883;
  (b) *Papula* Bayle, 1878.

(5) to place the following specific names (as suppressed under the plenary powers in (1) above) on the Official Index of Rejected and Invalid Specific Names in Zoology:
  (a) *papillataconoidea* Parkinson, 1811, as published in the binomen *Cidaris papillataconoidea*;
  (b) *savignyi* Audouin, 1826, as published in the binomen *Cidarites savignyi*.

REFERENCES

AUDOUIN, J. V. 1826. [In] *Description de l'Egypte*. Histoire naturelle. Vol. I. Pt. 4. Explication sommaire des planches d'Echinodermes de l'Egypte et de la Syrie, publiées par J. C. Savigny, etc. pp. 203–212. Paris

BAYLE, E. 1878. *Explication de la Carte Géologique de la France*. **4** Pt. 1. Fossiles principaux des Terrains, pls. i–clviii. Paris

BOUTAN, L. 1892. Voyage dans la Mer Rouge. *Rev. biol. Nord Fr.* **4** : 173–183, 210–223, 266–272, 351–362, 403–410, 463–468, 502–510, pls. vii–x; **5** : 40–44, 53–69

CLARK, H. L., and BATHER, F. A. 1909. The type of *Cidaris*. *Ann. Mag. nat. Hist.* (8) **3** : 88

CLARK, H. L. 1925. *A catalogue of the recent sea-urchins* (*Echinoidea*) *in the collection of the British Museum* (*Natural History*). xxviii+250 pp., pls. i–xii. London

COOKE, C. W. 1959. Cenozoic echinoids of eastern United States. *Prof. Pap. U.S. geol. Surv.* **321** : 1–106, 43 pls

COTTEAU, G. 1862–7. *Paléontologie Française, Terrain Crétacé*. **7**, Échinides: 1–892, pls. 1007–1204. Paris

DÖDERLEIN, L. 1887. *Die Japanischen Seeigel*. 1. (Cidaridae and Saleniidae). 59 pp., pls. i–xi. Stuttgart

LAMBERT, J., & THIÉRY, P. 1909. Notes Échinologiques, 1. Sur le genre *Cidaris*. *Bull. Soc. Sci. Nat. Haute-Marne*, **VI**: 10–32, 1 pl.

—— 1910. *Essai de Nomenclature Raisonée des Échinides*. Fasc. II: 81–160, pls. iii & iv. Chaumont

MANTELL, G. 1822. *The Fossils of the South Downs:* 1–327, pls. i–xlii. London

—— 1829. A Tabular Arrangement of the Organic Remains of the County of Sussex. *Trans. Geol. Soc. Lond.*, (2). **III**: 201–216

—— 1850. *A Pictorial Atlas of Fossil Remains:* i–xii, 1–207, pls. 1–74. London

MICHELIN, H. 1845. Zoophytes, Echinodermes et Stellérides de l'ile Maurice. *Mag. Zool., Paris.* (2) **1845** Zoophytes : 1–27, pls. 7–12

MILLOTT, N. 1953. Colour pattern and the definition of the species, *Diadema antillarum* Philippi. *Experientia* **9** : 98–99, figs. 1, 2

MORTENSEN, T. 1904. The Danish Expedition to Siam, 1899–1900. II. Echinoidea. *K. danske Vidensk. Selsk. Skr.* **7**, nat. math. **1** (1) : 1–124, 7 pls.

—— 1909. Die Echinoiden der Deutschen Südpolarexpedition 1901–1903. *Deutsch. Südpol. Exped.*, **XI**, Zool. III: 1–113, pls. i–xix

—— 1940. *A Monograph of the Echinoidea*. III. 1. Aulodonta. 370 pp. 77 pls. Copenhagen

NEAVE, S. A. 1940. *Nomenclator Zoologicus*. **III** M–P: 1–1065. London

PARKINSON, J. 1811. *Organic Remains of a Former World:* i–xvi, 1–479, pls. i–xxii. London

PHILIP, G. M. 1963. The Jurassic echinoid *Cidarites moniliferus* Goldfuss and the status of *Eucidaris*. *Palaeontology* **5** : 785–789, 1 fig., 1 pl.

POMEL, M. A. 1883. *Classification Méthodique et Genera des Echinides Vivants et Fossiles*. 131 pp., 1 pl. Alger

SAVIGNY, M. J. C. L. de. 1809–1817. *Description de l'Egypte*. Histoire naturelle. II. Atlas. Echinodermes. pls. i–ix. Paris

WRIGHT, T. 1822. Monograph on the British Fossil Echinodermata from the Cretaceous Formations. *Palaeontogr. Soc. Lond., Mon.* **1**, pt. 1: 1–64, pls.i–viii